

WHAT IS CLAIMED IS:

1. An apparatus comprising:

a membrane having a first side and a second side, the membrane being adapted to allow extreme ultraviolet radiation to pass from the first side to the second side, the membrane being adapted to prevent particles from passing from the first side to the second side, the membrane being less than 200 nanometers in thickness; and

a mesh of wires supporting the first side of the membrane.
2. The apparatus of Claim 1, further comprising an extreme ultraviolet radiation source, wherein the membrane allows extreme ultraviolet radiation to pass from the first side to the second side of the membrane.
3. The apparatus of Claim 1, wherein the wires have diameters of about 25 microns.
4. The apparatus of Claim 1, wherein the wires are spaced about 1 millimeter apart from each other.

5. The apparatus of Claim 1, wherein the mesh of wires and membrane are elastic.

6. The apparatus of Claim 5, further comprising a gas source operable to produce a gas that exerts pressure on the second side of the membrane and holds the membrane up against the mesh of wires.

7. The apparatus of Claim 6, wherein the gas source produces a repulsive jet through any pinholes in the membrane and prevents particles on the first side from entering the pinholes.

8. The apparatus of Claim 6, wherein the gas source removes particles from the second side of the membrane.

9. The apparatus of Claim 1, further comprising:
a reticle on the second side of the membrane;
a frame supporting edges of the membrane and the mesh of wires a pre-determined distance above the reticle.

10. The apparatus of Claim 9, wherein the frame supports edges of the membrane and the mesh of wires about one to ten centimeters above the reticle.

11. The apparatus of Claim 9, wherein the frame includes laser-drilled holes through which the wires are threaded.

12. The apparatus of Claim 9, wherein ends of the wires are bonded to the frame.

13. The apparatus of Claim 9, wherein the frame includes a spring-loaded tension apparatus to hold the mesh of wires.

14. The apparatus of Claim 1, wherein the membrane comprises embedded fibers.

15. The apparatus of Claim 1, wherein the membrane comprises embedded support beams.

16. The apparatus of Claim 1, wherein the membrane comprises a silicon layer.

17. The apparatus of Claim 1, wherein the membrane comprises a silicon layer, a silicon dioxide layer, and a plurality of support beams.

18. The apparatus of Claim 1, wherein the membrane comprises a substantially elastic, cured polymer-chain layer.

19. The apparatus of Claim 1, wherein the membrane comprises an organic layer of hydrophobic polymer on a substrate.

20. The apparatus of Claim 19, wherein the membrane further comprises a fibrous material layer.

21. A method comprising:
forming a mesh of wires;
forming a film proximal to the mesh of wires, the film being adapted to allow extreme ultraviolet radiation of a pre-determined range of wavelengths to pass through the film, the film being adapted to prevent particles from passing through the film, the film being less than 200 nanometers in thickness.

22. The method of Claim 21, further comprising forming a frame and attaching the mesh of wires to the frame.

23. The method of Claim 21, wherein the range of wavelengths is about 11-15 nanometers.

24. The method of Claim 21, further comprising applying a gas to press the film against the mesh of wires.

25. The method of Claim 21, further comprising passing radiation through the film to a reticle.

26. The method of Claim 21, wherein forming the film comprises:

depositing a layer of silicon dioxide on a silicon wafer;
patterning a plurality of lateral beam spaces on an exposed surface of the silicon dioxide layer;
etching the beam spaces to a pre-determined depth; and
electroplating metal in the etched spaces to form a plurality of beams.

27. The method of Claim 26, further comprising polishing the beams.

28. The method of Claim 26, further comprising repeating said patterning, etching and electroplating to form cross beams.

29. The method of Claim 26, further comprising depositing a silicon layer on top of the silicon dioxide and beams.

30. A method comprising:
forming an organic layer of hydrophobic polymer on a substrate;
depositing a film of fibrous material onto the layer of hydrophobic polymer to strengthen the layer and the substrate;
forming a mesh of wires on top of the film of fibrous material; and
performing a cure to cause cross-linking of polymers in the layer of hydrophobic polymer.

31. The method of Claim 30, wherein the substrate is silicon.